

SCIENCE & EDUCATION Impact

Benefits From the USDA/Land-Grant Partnership

Talking Trash

Waste management turns
a curse into a blessing.

Waste is a dirty word in today's society, but almost all endeavors—and animals—create waste products. Research and extension efforts by the U.S. Department of Agriculture (USDA) and Land-Grant universities make agricultural waste less of a burden and more of a benefit.

Payoff

- **Getting the scoop.** Animal agriculture tends to produce lots of manure, and disposing of it requires more than a shovel and a wheelbarrow. Land-Grant institutions develop environmentally sound disposal and application guidelines and find new, often beneficial uses for this nutrient-rich byproduct. Researchers at **Auburn, Georgia,** and **Tennessee** cooperate on establishing proper application rates for various soil types and climates. **Connecticut** Extension personnel help dairy farmers develop waste management plans, resulting in the application of 144 million pounds of manure to cropland as well as fertilizer cost savings of \$209,004 annually. Waste management workshops sponsored by **Iowa State** help farmers adjust land application rates. **Louisiana State** faculty connected New Orleans horse track owners—who spend \$200,000 a year disposing of horse manure—with nearby landfill operators, who now use the manure as compost for covered landfill sites.
- **Rationing rations.** Researchers develop animal rations that lower the volume and nutrient load of animal waste. **Missouri** and **Virginia Tech** researchers add an enzyme to hog rations that reduces the need for phosphorus in feed and reduces the phosphorus in manure by 25 to 40 percent. **Cornell** and **Minnesota** researchers use similar enzyme feed supplements in poultry rations. The enzyme used at Minnesota reduces the phosphorus content of turkey manure by 27 percent.
- **Mechanizing manure.** Land-Grant research develops better ways to handle agricultural wastes mechanically. **Purdue** researchers converted a standard manure spreader into a high-tech computerized manure applicator that uses precision farming technology to target land applications more effectively. **Michigan State** researchers developed a machine that separates 90 percent of sand, which is a common bedding material, from manure. The machine cleans the sand

RESEARCH,
EDUCATION, AND
EXTENSION
AT WORK

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so it can be re-used by the farmer. **Minnesota** and **Virginia Tech** faculty developed manure application-planning computer programs, currently used on 400 **Virginia** farms.

- **Carcass control.** When livestock and poultry die, carcass disposal is a big problem for producers. Incineration and burial pose environmental and health concerns, so Land-Grant researchers developed new, safer composting systems. **Ohio State** faculty established on-farm composting facilities for swine operations. The facilities decompose carcasses and destroy pathogens in 180 days, leaving a byproduct that can be spread on farm fields. **Delaware, Maryland,** and **Virginia** produce millions of chickens each year. When hot weather causes sudden and catastrophic mortalities, producers rely on extension training to manage the onslaught. On-farm composting systems developed by **Maryland** researchers are used by more than half of the 2,600 poultry producers in the Maryland-Delaware region. Thanks to similar work at **North Carolina State**, more than 700 poultry producers now operate composters in the state. Last year, **North Dakota State** Extension specialists helped safely dispose of more than 10 million pounds of dead animals lost during floods and severe weather.
- **Washing up.** Researchers at **North Carolina State** help the processed egg industry recover protein and fat for use as a feed additive, potentially reducing city water-treatment costs by \$1 million a year. **Mississippi State** research and extension faculty help dairy farmers meet "no discharge" wastewater requirements by finding the most affordable, efficient, and environmentally sound ways to dispose of wastewater. **Ohio State** researchers help food processors and restaurants clean their wastewater using bioreactors, which are more rapid and energy efficient than traditional treatment methods and which also keep fats and oils out of landfills.
- **Positive chemistry.** Disposing of used chemical containers and unused chemicals is a big environmental challenge for agricultural producers. Research and extension efforts, however, have helped producers safely recycle and dispose of these items. **Nebraska** Extension spearheads a pesticide container recycling program that collected nearly 43 tons of recyclable

containers in 1997. Last year, similar **South Dakota** Extension efforts resulted in collection of 55,000 plastic pesticide containers and 30,000 pounds of unusable pesticide. **Georgia, Mississippi State, Texas A&M,** and **Virginia Tech** all have organized pesticide disposal programs in their states. In the past four years alone, **Mississippi's** program collected 600,000 pounds of agricultural pesticide.

- **Making the most of compost.** Composting and recycling have benefited farmers and homeowners as well as municipalities, landfills, and other operations. Land-Grant efforts promote this valuable practice. Highly successful yard-waste composting programs have been established in **Alabama, California, Georgia, Indiana, Louisiana, Pennsylvania,** and **Wisconsin.** California's composting program keeps 1.2 million tons of yard waste out of landfills annually. A Wyoming recycling project, run entirely by volunteers and coordinated by **Wyoming** Extension agents, collects some 13,000 cubic feet of recyclable refuse each year. **Delaware** Extension specialists coordinate a large-scale industrial composting effort that helps keep tons of industrial waste out of landfills and produces a product that enriches the region's soils.
- **Recycling for agriculture.** Land-Grant research and extension efforts find ways to use industrial wastes safely and effectively to benefit agriculture. At **Ohio State**, researchers found that a byproduct of power plant scrubbers could safely be used as a limestone substitute to improve acidic agricultural soils. **Auburn** University researchers have found agricultural applications for sludge and ash from paper companies and residues from cotton mills, as have researchers at **Georgia, Louisiana State,** and **Wisconsin.**



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